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$$E = 500 \text{ J}$$

$$t = 1,0 \text{ min} = 60 \text{ s}$$

$$\Delta S_c = 20 \text{ m}$$

$$\Delta S_A = 10 \text{ m}$$

$$I_c = ?$$

$$I_A = ?$$



$$I = \frac{E}{A \Delta t}$$

$$A_A = 4\pi r_A^2 = 1256,6 \text{ m}^2$$

$$I_A = \frac{500 \text{ J}}{1256,6 \text{ m}^2 \cdot 60 \text{ s}} = 6,63 \times 10^{-3} \frac{\text{W}}{\text{m}^2}$$

$$A_c = 4\pi r_c^2 = 5026,5 \text{ m}^2$$

$$I_c = \frac{500 \text{ J}}{5026,5 \text{ m}^2 \cdot 60 \text{ s}} = 1,7 \times 10^{-3} \frac{\text{W}}{\text{m}^2}$$

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$$d = 60 \text{ m}$$

$$v = 332 \text{ m/s}$$

$$\Delta t = ?$$

$$\Delta t = \frac{2d}{v}$$

$$\Delta t = \frac{2 \cdot 60 \text{ m}}{332 \text{ m/s}} = 0,36 \text{ s}$$

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$$n = 2L$$

$$f_1 = 256 \text{ Hz}$$

$$L_1 = 1,00 \text{ m}$$

$$L_2 = 0,400 \text{ m}$$

$$f_2 = ?$$

$$f = \frac{v}{2L}$$

$$f_1 = \frac{v}{2L_1} \quad f_2 = \frac{v}{2L_2}$$

$$\frac{f_1}{f_2} = \frac{v}{2L_1} \cdot \frac{2L_2}{v} \quad f_2 = f_1 \frac{L_1}{L_2}$$

$$f_2 = 256 \text{ Hz} \cdot \frac{1,00 \text{ m}}{0,400 \text{ m}} = 640 \text{ Hz}$$

$$n = 25$$

$$v = 310 \text{ m/s}$$

$$f_n = 375 \text{ Hz}$$

$$f_{n+1} = 450 \text{ Hz}$$

$$L = ?$$

$$f^* = ?$$

$$f_n = \frac{v \cdot n}{2L}$$

$$f_{n+1} = \frac{v \cdot (n+1)}{2L}$$

$$\frac{f_n}{f_{n+1}} = \frac{v \cdot n}{2L} \cdot \frac{2L}{v(n+1)}$$

$$\frac{f_n}{f_{n+1}} = \frac{n}{n+1} \rightarrow \frac{375 \text{ Hz}}{450 \text{ Hz}} = \frac{n}{n+1}$$

$$\frac{375 \text{ Hz}}{450 \text{ Hz}} - \frac{n}{n+1} = 0$$

$$\frac{0,83 \cdot (n+1) - n}{n+1} = 0$$

$$\text{FINIRE, } 0,16 \text{ m} = \frac{0,83}{0,16} = -4,98$$